

**This Page Is Inserted by IFW Operations  
and is not a part of the Official Record**

## **BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning documents *will not* correct images,  
please do not report the images to the  
Image Problem Mailbox.**

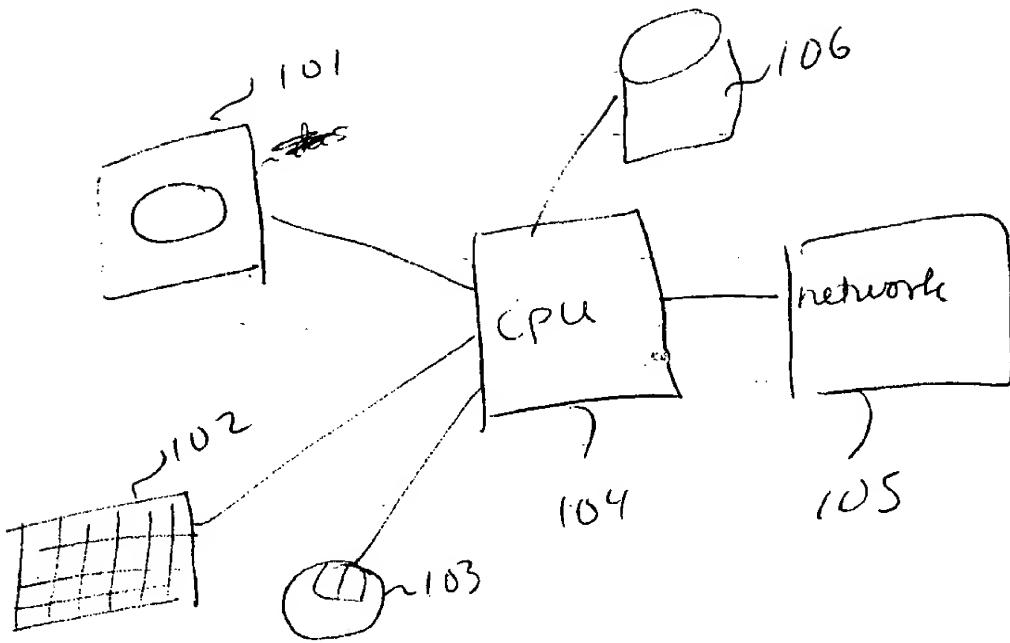
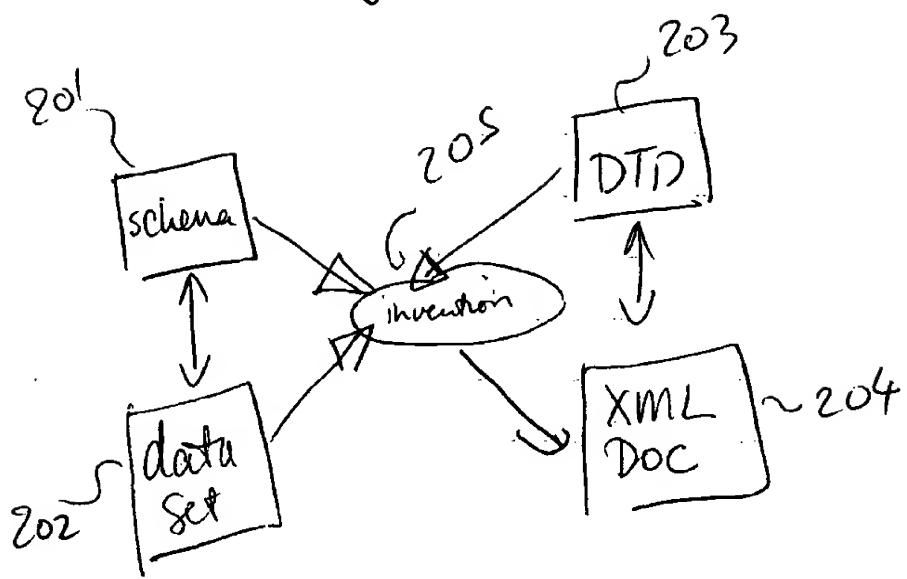


Fig. 1

Fig. 2



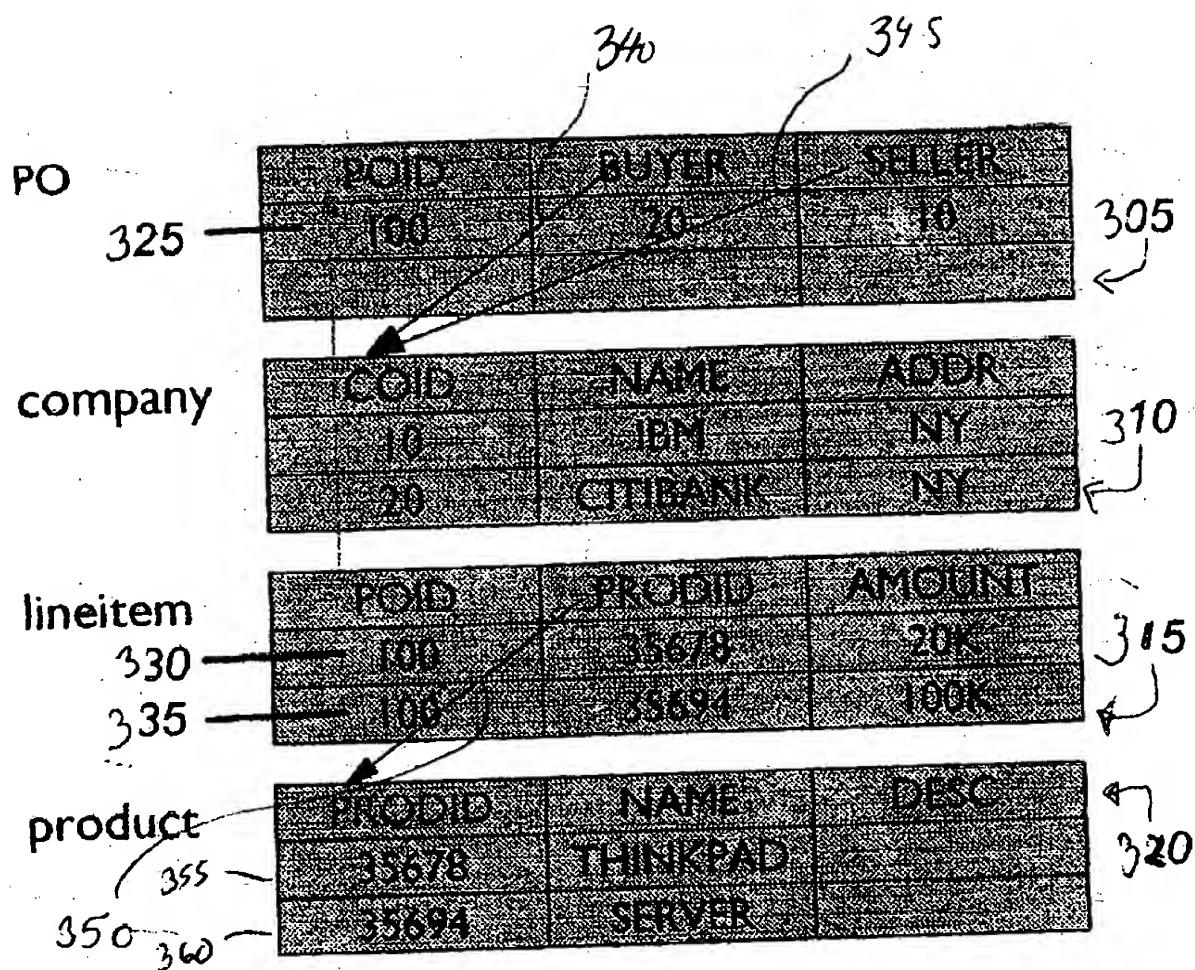


Figure 3a Example purchase order relational schema

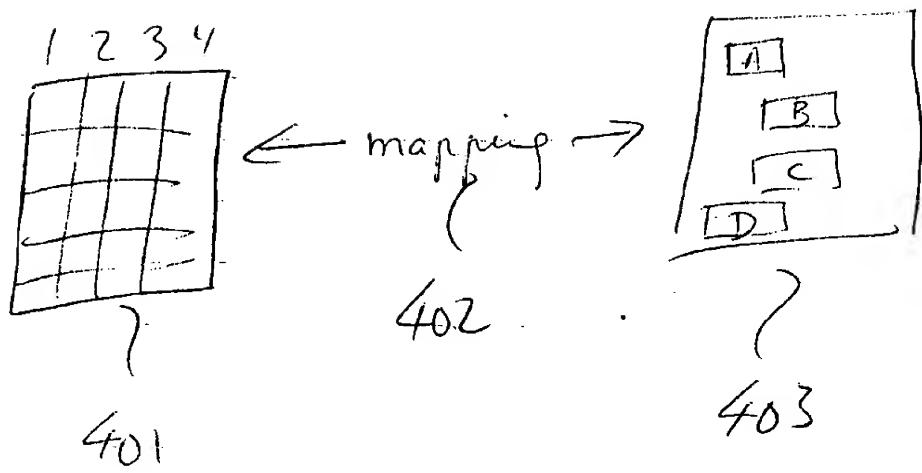
```

301 <!DOCTYPE PO [
302   ~<!ELEMENT PO (id, buyer, seller, (lineitem)* )>
303   ~<!ELEMENT id (#PCDATA)>
303   ~<!ELEMENT buyer (address)>
304     ~<!ATTLIST buyer
304       name CDATA #REQUIRED >
304
304   ~<!ELEMENT seller (address)>
305     ~<!ATTLIST seller
305       name CDATA #REQUIRED >
306   ~<!ELEMENT address (#PCDATA)>
307   ~<!ELEMENT lineitem (prodname, amount)>
308     ~<!ELEMENT prodname (#PCDATA )>
308     ~<!ELEMENT amount (#PCDATA )>
309   ]>

```

Figure 3b. Example DTD

Fig 4

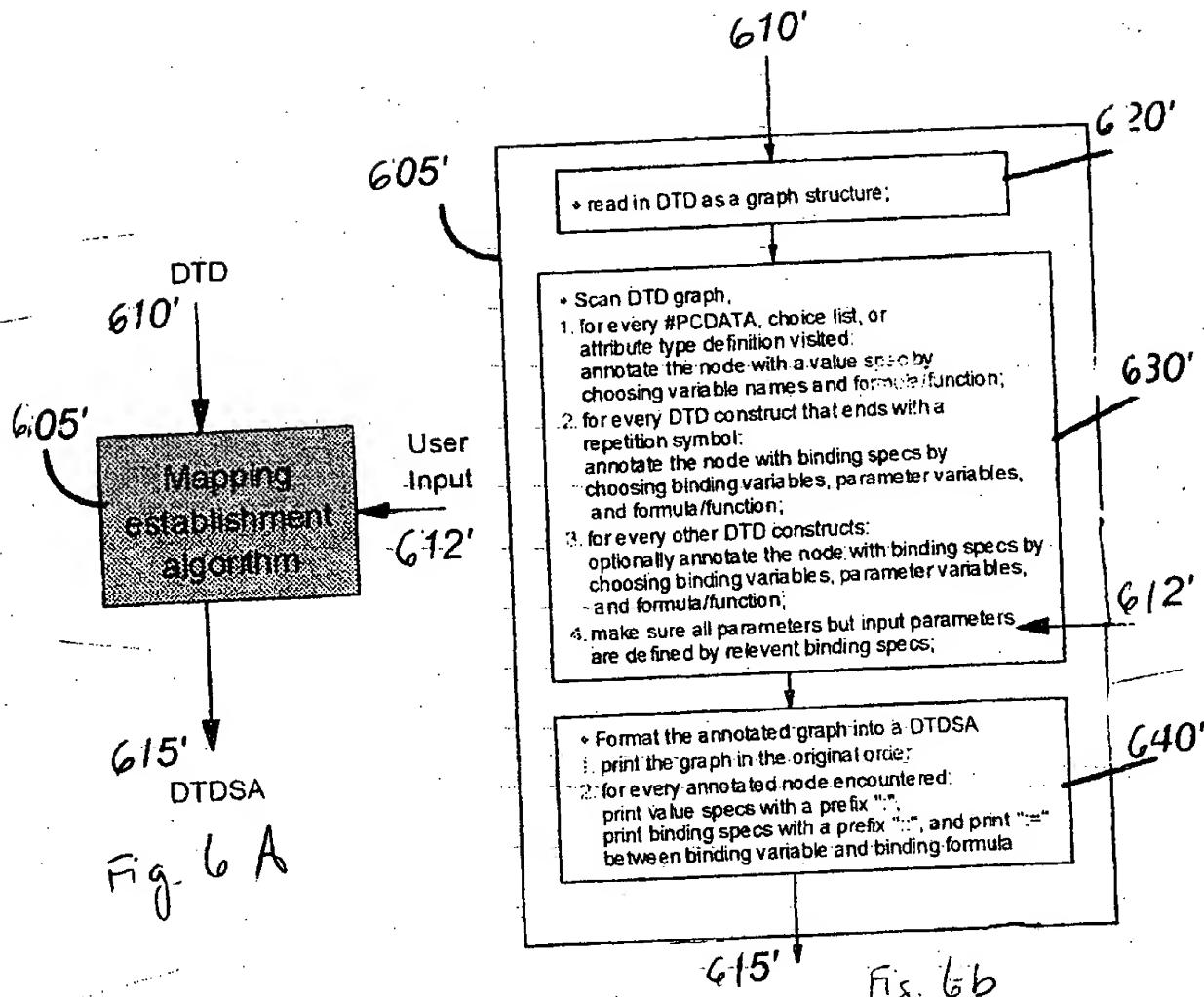


```

<!DOCTYPE PO [
  <!ELEMENT PO (id, buyer, seller,
    (lineitem)* :: w:= row(lineitem, poid, PO.poid(r)) )>
    5 00                                5 05
    :: r:=row(PO, poid, x) 5 10
  <!ELEMENT id (#PCDATA :PO.poid(r))> — 5 15
  <!ELEMENT buyer (address)> :: s:= row(company, id, PO.buyer(r)) — 5 35
  <!ATTLIST buyer
    name CDATA #REQUIRED :company.name(s) > 5 20
  <!ELEMENT seller (address)> :: s:= row(company, id, PO.seller(r)) — 5 40
  <!ATTLIST seller
    name CDATA #REQUIRED :company.name(s) >
  <!ELEMENT address (#PCDATA :company.addrs)> — 5 25
  <!ELEMENT lineitem (prodname,
    amount)> :: v:= row( prod, prodid, lineitem.prodid(w))
    5 45
  <!ELEMENT prodname (#PCDATA :product.prodname(v))>
  <!ELEMENT amount (#PCDATA :lineitem.amount(w))>
]>

```

Figure 5 Example DTDSA



Algorithm for establishing the mapping in DTDSA format

input parameter  
pairs  
 $(A=1;B=100)$

DTDSA

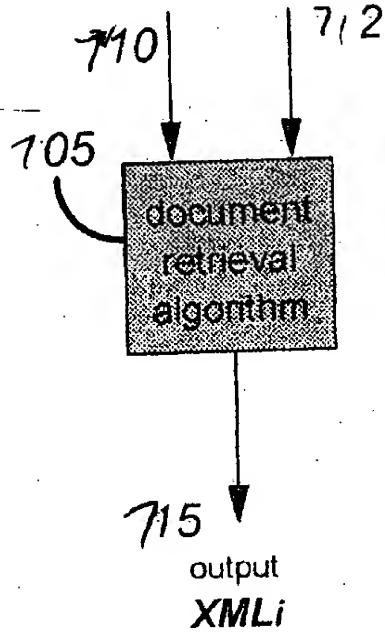


Fig. 7a

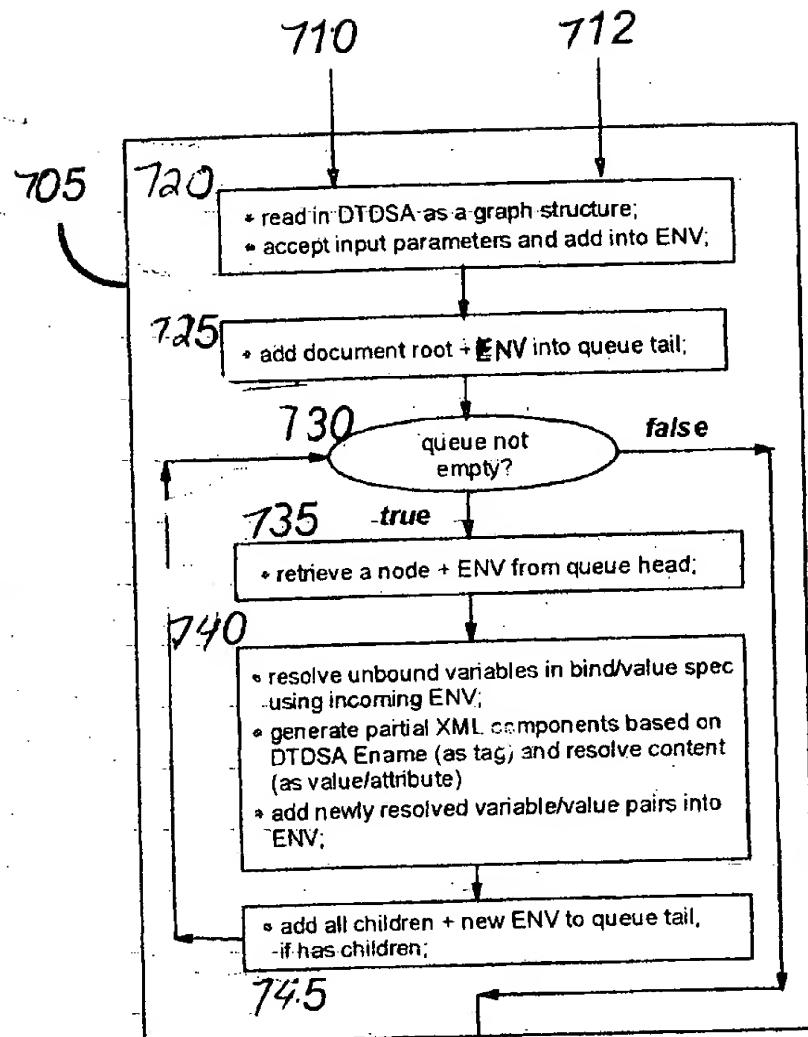


Fig. 7b

Algorithm for generating XML using DTDSA

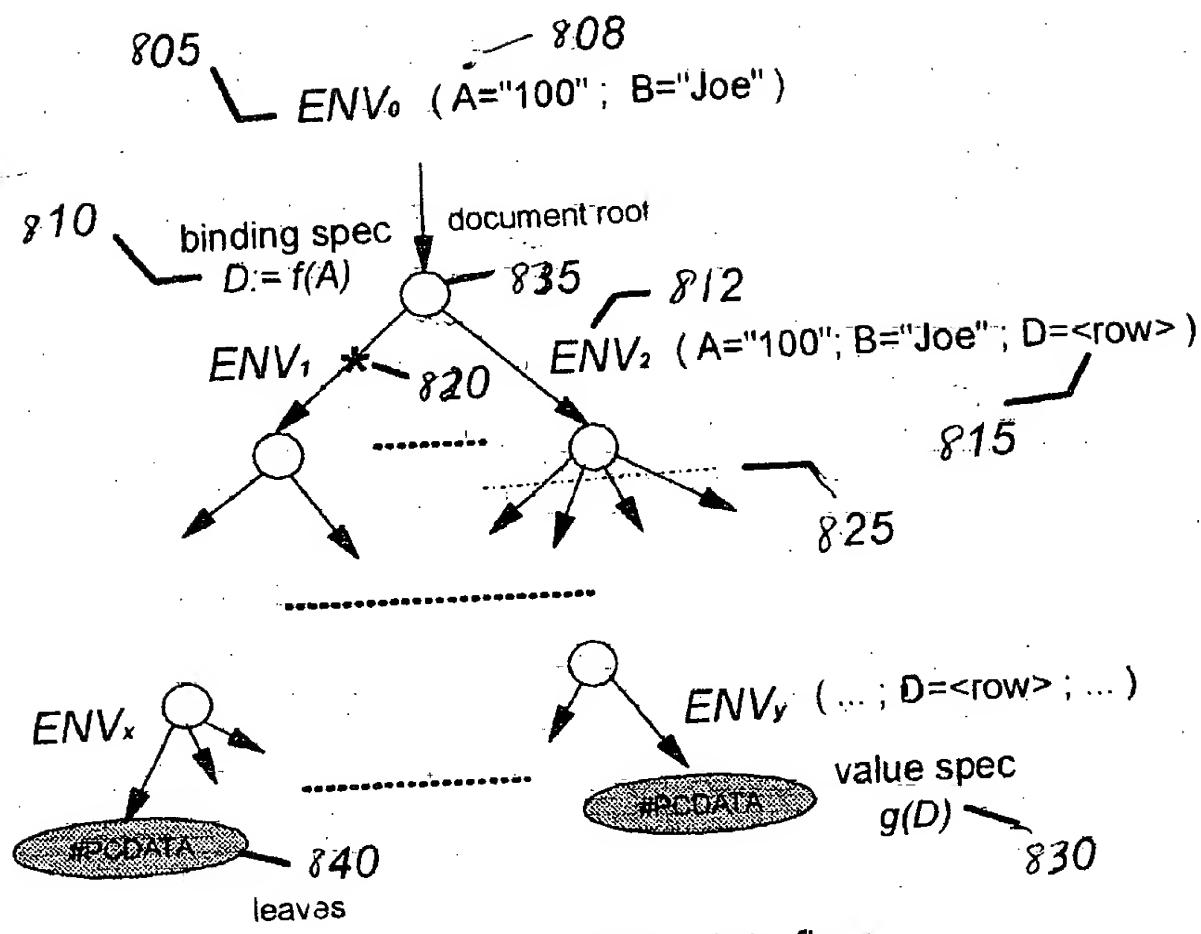
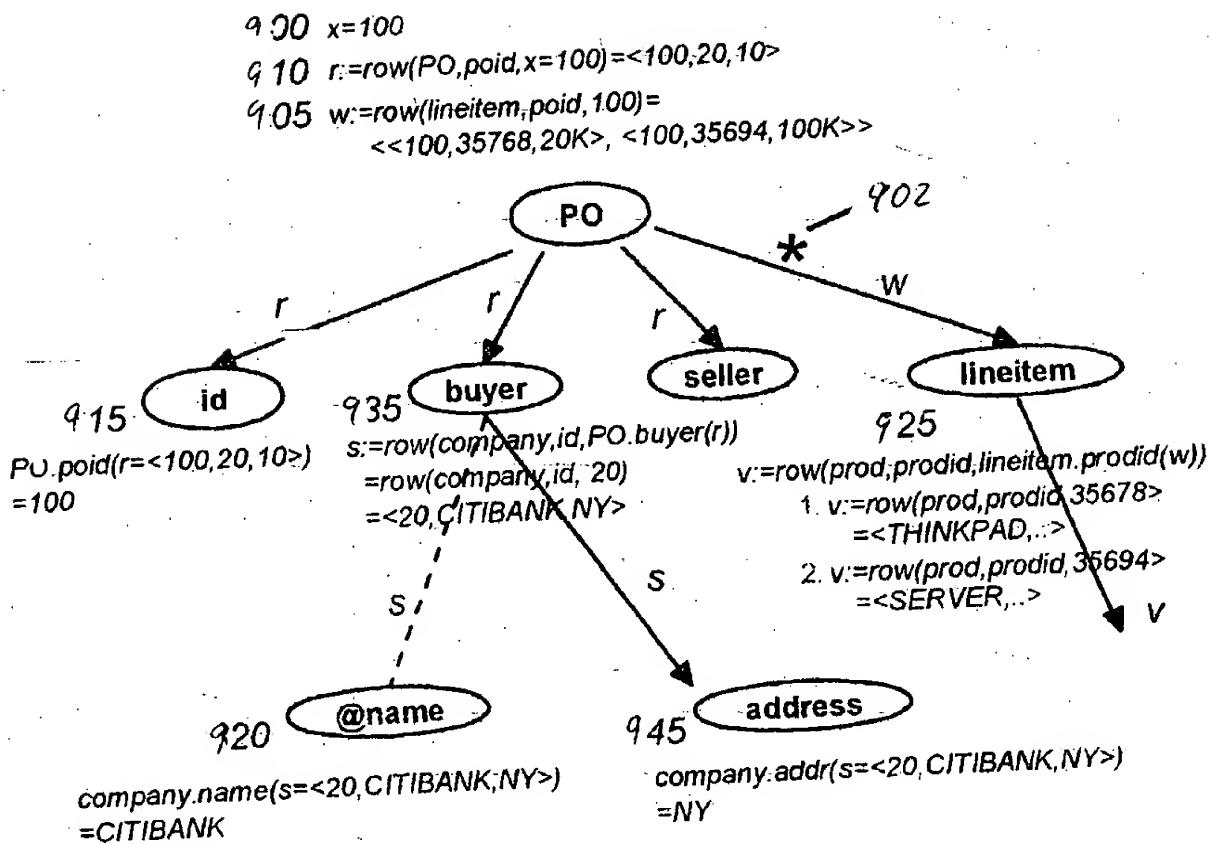


Figure 8 XML composition data flow

Figure 9 XML composition example with input  $x=100$

```
<PO>
  <id> 100 </id>          /005
  <buyer name="CITIBANK">
    <address> NY </address>
  </buyer>                  /010
  <seller name="IBM">
    <address> NY </address>
  </seller>
  <lineitem>
    <prodname> THINKPAD </prodname>
    <amount> 20K </amount>
  </lineitem>
  <lineitem>
    <prodname> SERVER </prodname>
    <amount> 100K </amount>
  </lineitem>
</PO>
```

Figure 10 Retrieved XML document (with input  $x=100$ )